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# *ARS Science Hall of Fame*

*September 10, 2014*



**Agricultural Research Service  
U.S. Department of Agriculture**

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A special website is available that features photographs and biographies of all ARS Science Hall of Fame inductees since the inaugural year of 1986. Special features include browse and search functions and video clips from interviews with some members of the Hall of Fame.

Please visit [www.ars.usda.gov/careers/hof/](http://www.ars.usda.gov/careers/hof/)

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# Agricultural Research Service

## SCIENCE HALL OF FAME

The ARS Science Hall of Fame was inaugurated in 1986. We determined that each succeeding year, one or more present or former scientists with the Agricultural Research Service could be selected, subject to the following criteria:

The selectee made widely recognized impact on agricultural research by the solution of a significant agricultural problem through research.

The selectee is a person whose scientific accomplishments and stature continue to affect the agricultural research community and/or influence the development of science-based agricultural policy.

The selectee's character and record of achievement have brought major recognition and credibility to ARS and/or USDA, and are worthy of emulation by younger agricultural scientists.

The selectee's achievements must be or have been nationally and/or internationally recognized by peers in the scientific community.

Today we honor four outstanding scientists by inducting them into the Science Hall of Fame. A plaque citing the achievements of each will be added to the permanent exhibit in the George Washington Carver Center, Beltsville, MD.

A handwritten signature in black ink that reads "Chavonda Jacobs-Young". The signature is fluid and cursive, with the first name "Chavonda" being the most prominent.

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Chavonda Jacobs-Young  
Administrator



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SCIENCE HALL OF FAME

**Perry B. Cregan**

Research Leader

Soybean Genomics and Improvement Laboratory  
Beltsville, MD

*For pioneering research in developing genetic tools, widely used to improve legumes and grains worldwide, that are helping feed a hungry world.*

Perry B. Cregan is an internationally recognized expert on DNA markers and the use of this technology to improve the health and productivity of soybean, wheat, and other crops. He was first to discover and document markers known as “simple sequence repeats” in a plant species and demonstrated their usefulness in constructing genetic maps to locate genes for economically important traits, including pest and disease resistance, better tolerance to stresses such as drought, increased yield, and improved seed quality.

Cregan’s groundbreaking research on another marker type—single nucleotide polymorphisms (SNPs)—dispelled long-held assumptions about genetic variability and the impact of breeding in U.S. soybean varieties. His findings indicated that wild soybeans, more so than the Asian landraces from which today’s cultivars are derived, offer the greatest source of genetic diversity. His expertise is widely sought both domestically and abroad with collaborations that include efforts to develop and apply common bean markers with plant breeders at the International Center for Tropical Agriculture and other organizations.

Cregan’s contributions also have been instrumental in the design of cutting-edge gene chip technology enabling the analysis of 50,000 SNP markers in current soybean genotypes. He has received numerous awards, including the 2004 Federal Laboratory Consortium Award for Excellence in Technology Transfer. He is a Fellow of the Crop Science Society of America, the American Society of Agronomy, and other professional organizations.





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SCIENCE HALL OF FAME

**Jerry L. Hatfield**

Laboratory Director and Plant Physiologist  
National Laboratory for Agriculture and the Environment  
Ames, IA

*For leadership and creativity in building the scientific foundation for agricultural practices leading to improved efficiency and reduced environmental impact of agricultural systems.*

Jerry L. Hatfield is an international expert who has vastly expanded our understanding of the relationships between farming systems, environmental quality, and global climate change. He works with farmers, scientists, and government agencies to improve production management, reduce nutrient runoff, improve air quality, protect soil and groundwater resources, reduce costs, and increase crop yields.

Since 1989 he has provided outstanding leadership at the National Laboratory for Agriculture and the Environment in Ames, IA, which supports research programs throughout the United States and currently directs the Midwest Climate Hub to extend research information to producers.

He currently co-leads an international effort to assess current crop simulation models and how future climate scenarios will affect world food security. He has served as the lead author on numerous high-profile publications discussing agriculture and climate change, including chapters for the National Climate Assessment and an Intergovernmental Panel on Climate Change special report.

He has authored over 405 refereed publications and given over 425 invited presentations. He has won numerous awards including ARS Scientist of the Year Award, USDA Superior Service Award, Arthur S. Flemming Award for Outstanding Federal Service, Presidential Rank Merit Award, and Federal Laboratory Consortium Award.



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SCIENCE HALL OF FAME

**Hyun S. Lillehoj**

Senior Research Microbiologist  
Animal Biosciences and Biotechnology Laboratory  
Beltsville, MD

*For a lifetime of distinctive agricultural research impact, mentoring, and transfer of technologies that have benefited small and large poultry producers worldwide and contributed to global food security.*

Hyun S. Lillehoj is one of the world's premier leaders in the field of avian immunology, adapting genomic tools early in her career to understand host immunity and pathogen interactions to infectious poultry disease. Focusing on coccidiosis and necrotic enteritis, which together cost the U.S. poultry industry more than \$5 billion annually, Lillehoj has developed poultry immune reagents for assaying host immune response and vaccines. During the past 10 years, she has made more than 20 original discoveries of chicken immune cells and molecules that are critical in controlling infectious poultry diseases. Many of these technologies have been licensed and commercialized by private industry.

Lillehoj is the recipient of 11 patents that have significant applications in the fields of poultry science—including recombinant vaccines, therapeutic peptides and antibodies as well as plant photochemical-based antibiotic alternative strategies.

A pioneer of novel technology, Lillehoj is at the forefront of significant scientific breakthroughs that provide alternative strategies for preventing diseases in commercial poultry farms worldwide. These discoveries have contributed to increasing production efficiency and the U.S. poultry industry's competitiveness in international markets. In addition, her findings are helping to mitigate drug use in food animal production, reduce drug contamination of food for human consumption and decrease the incidence of antibiotic-resistant pathogens.

Lillehoj is the recipient of numerous national and international awards including the Pharmacia/Upjohn Animal Health Achievement Award, Distinguished Research Achievement Award, ARS Scientist of the Year Award, Merck Outstanding Research Award, Pfizer Animal Health Fundamental Science Award, and Phibro Animal Health Excellence in Research Award.



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SCIENCE HALL OF FAME

**Ross Welch**

Plant Physiologist (Retired)

Robert W. Holley Center for Agriculture and Health  
Ithaca, NY

*For being a world leader on pioneering work linking agricultural research to human nutrition and health with a focus on micronutrient malnutrition in developing countries.*

Ross Welch is a driving force behind biofortifying some of the world's most important crops to combat micronutrient malnutrition, a problem that afflicts more than two billion people worldwide. Recognized internationally, his research focuses on enhancing micronutrients through plant breeding and the use of fertilizers.

Welch is credited with discovering that nickel (Ni) is an essential micronutrient for higher plant growth and identifying the importance of urease in higher plant development. The work opened the door to new areas of research and led to studies showing how Ni deficiencies can cripple pecan trees and cause toxic concentrations of urea in soybeans and cowpeas. Greenhouse horticultural crops throughout the United States and thousands of acres of pecan trees are often treated with Ni fertilizers as a result of his work.

He also was a pioneer in showing the critical role of zinc (Zn) in plant health and productivity and the potential health benefits of fertilizing legumes and other food crops with Zn. As a result, soils are now fertilized with Zn in parts of the world where people suffer from health problems caused by Zn deficiencies.

Welch has published over 200 peer-reviewed journal papers, book chapters, and reviews, and his research has been cited thousands of times in scientific journals. He also has given hundreds of presentations and was instrumental in establishing HarvestPlus, an international biofortification program, and in securing a number of major grants for its research and crop improvement programs. He has received many awards including ARS Scientist of the Year Award.

# ARS SCIENCE HALL OF FAME

**1986**

**Edward F. Knippling**

*For pioneering research and leadership in development of the sterile insect technique, which led to the eradication of the screwworm, and of other technologies to suppress and manage insect pests.*

**1987**

**Howard L. Bachrach**

*For pioneering research on the molecular biology of foot-and-mouth disease that led to development of the world's first effective subunit vaccine for any disease of animals or humans through the use of gene splicing.*

**Myron K. Brakke**

*For consistent, career-long valuable contributions to the science of virology, particularly plant virology.*

**Glenn W. Burton**

*For outstanding achievements in forage and turf science, which have had extraordinary effects on the forage-based cattle industry, the turf industry, and agriculture worldwide.*

**Wilson A. Reeves**

*For outstanding research and leadership in the field of textile chemical finishing that have significantly benefited agriculture and consumers.*

**Earnest R. Sears**

*For pioneering work in wheat genetics and for discoveries on chromosomal mechanisms that established standards in animal, plant, and human genetics.*

**Orville A. Vogel**

*For development of the first useful semidwarf wheats and of innovative production systems that made the Pacific Northwest a major source of soft white wheat, inspired similar research efforts throughout the world, and sparked the Green Revolution.*

**Cecil H. Wadleigh**

*For elucidating the mechanisms through which crops respond to salinity and water stress and for inspired planning and leadership that enabled and motivated those who worked with him to expand and make use of knowledge of soils, water, and air and their interactions with plants.*



1988

**Francis E. Clark**

*For outstanding research leading to greater understanding of soil, plant, and microbial interactions and of nutrient cycling in terrestrial ecosystems.*

**Edgar E. Hartwig**

*For research in soybean breeding and genetics that has been a major factor in soybeans becoming the second most valuable U.S. crop and particularly for developing cultivars that thrive in the South.*

**Ralph E. Hodgson**

*For significant contributions to the knowledge of ruminant nutrition and for visionary leadership, both domestic and international, in the animal industries.*

**Hamish N. Munro**

*For career-long contributions to the science of nutrition, particularly on the relationship of dietary protein and iron to the health of the elderly, and for promotion of studies on aging.*

**Jose Vicent-Chandler**

*For research leading to new and greatly improved production systems for beef, milk, coffee, plantains, and rice for Puerto Rico and Caribbean countries.*

1989

**Douglas R. Dewey**

*For world leadership in genetics and taxonomy of the Triticeae tribe of grasses and for development of the cytogenetic basis for creating new grass hybrids.*

**Theodor O. Diener**

*For conceptualizing and discovering viroids, for leading research on viroid detection and control, and for inspiring new approaches in the search for causes of several serious diseases affecting plants, livestock, and humans.*

**Karl H. Norris**

*For developing principles and instruments using the electromagnetic wave spectrum to make rapid nondestructive measurements for evaluating quality of agricultural products.*

**John F. Sullivan**

*For engineering contributions to the food-processing and preservation industries, including development of instant potato flakes and of batch and continuous-explosion puffing.*

1990

**Theodore C. Byerly**

*For extraordinary contributions as a scientist, research leader, and administrator to the success of agricultural research programs and advances in U.S. and world agriculture.*

**Gordon Dickerson**

*For research contributions widely used by breeders to increase production efficiency of cattle, sheep, swine, and poultry.*

**Robert W. Holley**

*For isolation and characterization, including the first nucleotide sequence, of transfer ribonucleic acid (tRNA).*

**Virgil A. Johnson**

*For outstanding contributions to development of superior bread wheat cultivars and of improved wheat germplasm and for vigorous promotion of national and international cooperation among wheat breeders.*

**George F. Sprague**

*For outstanding contributions to effective methods of hybrid corn breeding and germplasm improvement.*

1991

**John H. Weinberger**

*For outstanding lifelong contributions in development of fruit varieties and fruit-breeding technology.*

**Walter H. Wischmeier**

*For developing the Universal Soil Loss Equation, which has been widely used for three decades worldwide in conservation and management of our natural resources.*

1992

**Raymond C. Bushland**

*For pioneering research leading to screwworm eradication by the sterile insect technique and for research leading to control of typhus vectors.*

**Lyman B. Crittenden**

*For significant contributions to retroviral genetics, transgenic animal development, and genome mapping in poultry.*



**Arnel R. Hallauer**

*For increasing understanding and use of quantitative genetics in plant breeding, which has led to development of many superior corn hybrids worldwide.*

**1993**

**John R. Gorham**

*For scientific leadership and studies that have resulted in solutions of disease control problems and have advanced the basic knowledge of viral and genetic diseases in humans and animals.*

**Sterling B. Hendricks**

*For significant contributions as a chemist, physicist, mathematician, plant physiologist, geologist, and mineralogist.*

**Clair E. Terrill**

*For scientific contributions and worldwide leadership in sheep production research.*

**1994**

**Charles N. Bollich**

*In recognition of superlative accomplishments in rice breeding and genetics and their consequent benefits to American agriculture.*

**Chester G. McWhorter**

*For outstanding contributions to American agriculture through basic and applied research that has resulted in improved weed-management technology, increased yields, and reduced cost of production.*

**Malcolm J. Thompson**

*For career research contributions in the field of insect and plant steroid biochemistry.*

**1995**

**Harry Alfred Borthwick**

*In recognition of contributions in elucidating the importance of photoperiodic mechanisms controlling flowering in plants.*

**William M. Doane**

*For initiating, leading, and conducting research that created new and useful products and led to the establishment of new industries based on agricultural raw materials.*

**Walter Mertz, M.D.**

*For contributions and leadership in elucidating the importance to health of several trace elements and promoting research on dietary risk factors for chronic disorders.*

**1996**

**Fred W. Blaisdell**

*For pioneering research and development of improved structures for soil and water conservation.*

**Herbert J. Dutton**

*For pioneering research leading to the establishment of soybean oil as the predominant edible vegetable oil in the world.*

**Charles Jackson Hearn**

*For developing improved orange, grapefruit, and tangerine varieties used extensively by U.S. citrus producers to replace trees killed by the 1980 freezes and to expand the citrus acreage.*

**1997**

**Morton Beroza**

*For major contributions to the development of environmentally compatible insect control strategies through discovery of lures, attractants, repellents, and pheromones.*

**R. James Cook**

*For extraordinary research on sustainable approaches to improve wheat health and for leadership in the transfer of information and technology resulting in solutions to agricultural problems.*

**William L. Ogren**

*For outstanding leadership and fundamental contributions to photosynthetic carbon metabolism leading to the discovery of new opportunities to improve the efficiency and productivity of crop plants.*

**1998**

**Thomas J. Henneberry**

*For conducting basic and applied individual and team research that has had sustained global impact on development and implementation of integrated pest management systems.*

**James H. Tumlinson III**

*For research that led to eradication of the boll weevil from the southeastern United States and the discovery of the chemical basis of plant-insect-parasite interaction.*

**1999**

**Allene R. Jeanes**

*For microbiological, chemical, and engineering research that created urgently needed, life-saving industrial polymers made from agricultural commodities.*

**Charles W. Stuber**

*For pioneering the use of molecular markers in identifying, mapping, and manipulating quantitative trait genes.*

**Richard L. Witter**

*For outstanding research contributions and leadership in the field of avian tumor viruses.*

**2000**

**Virginia H. Holsinger**

*For research leading to increased use of milk products and for humanitarian efforts in developing nutritious formulations for international food donation programs.*

**Marvin E. Jensen**

*For advancements in irrigation scheduling using computer models to estimate soil-water balance and for advancements in evapotranspiration theory.*

**Harley W. Moon**

*For contributions to a fundamental understanding of intestinal diseases in livestock and for development of effective control programs for these diseases.*

**2001**

**Lawrence A. Johnson**

*For pioneering research in developing the first useful technology for gender preselection of animal and human offspring and for outstanding contributions to semen preservation and artificial insemination in swine.*

**William E. Larson**

*In recognition of a pioneer who respected soil as a natural resource and devoted a research career toward improving its quality.*

**William L. Mengeling**

*For outstanding research contributions and leadership in the field of viral diseases of swine.*

2002

**George Inglett**

*In recognition of the development of novel, patented food ingredients including Oatrim and Nutrim, which have had a sustained beneficial effect on the American diet.*

**K. Darwin Murrell**

*For landmark research on parasites of veterinary and medical importance, especially trichinellosis of swine, and innovative development and leadership of laboratory and agency-level programs that established and advanced objectives of the Agricultural Research Service.*

**Stuart O. Nelson**

*For pioneering research on the dielectric properties of agricultural materials, applications of radio-frequency and microwave energy, and electrical measurements for moisture sensing in cereal grains.*

2003

**Edward B. Bagley**

*For outstanding research in rheology and food science that generated fundamental understanding of flow mechanics; and for pioneering concepts in super-absorbent materials that resulted in one of the most successful technology transfers in USDA history.*

**Janice M. Miller**

*For pioneering research in understanding, diagnosing, and controlling bovine leukemia, transmissible spongiform encephalopathies, and other chronic infectious or zoonotic diseases of ruminants.*

2004

**Donald K. Barnes**

*For remarkable contributions to alfalfa breeding and genetics, mentoring of plant breeding students, and service to ARS and the scientific community.*

**Ruth Rogan Benerito**

*For applying physical chemistry to solve problems that led to improved procedures and new uses for renewable resources such as cotton, wood, and paper.*

**Keith E. Gregory**

*For outstanding research contributions in genetics and breeding of beef cattle and for leadership of ARS research programs.*

2005

**Charles W. Beard**

*For outstanding contributions in poultry health research, in professional and organizational leadership, and in developing biocontainment concepts and systems for animal agriculture.*

**Nelson A. Cox**

*For lifetime contributions of distinctive research benefitting the poultry industry and public health through development and transfer of technologies that reduced foodborne pathogens, particularly Salmonella and Campylobacter.*

**Sigmund Schwimmer**

*For a distinguished career of scientific excellence in enzymology and its application to food science and human food products and quality.*

**Tien C. Tso**

*For outstanding research contributions and leadership in plant physiology and phytochemistry and their use to advance plant science.*

2006

**Wayne W. Hanna**

*For significant scientific contributions to U.S. food production and the national recreation industries and for related scientific achievements for research on apomixis and interspecific germplasm transfer.*

**Ray D. Jackson**

*For elucidating the basis of soil-plant-water-atmosphere relationships and developing innovative methods to assess and manage crop status through remote sensing.*

**Vernon G. Pursell**

*For lifetime contributions to genetic and reproductive development of livestock through pioneering research in genetic engineering and semen preservation.*

2007

**Johnie N. Jenkins**

*For pioneering leadership, vision, innovative cotton host plant resistance research and technologies, impact on science, and development and mentoring of young scientists.*

**Dennis Gonsalves**

*For pioneering research and leadership in plant pathology and biotechnology to increase agricultural productivity and improve human health.*

**Janet C. King**

*For national and international leadership and research achievement  
in human nutrition.*

**2008**

**Robert E. Davis**

*For meritorious and exemplary contributions to the science of plant pathology  
and for a dedicated career of service to the Agricultural Research Service.*

**Andrew N. Sharpley**

*For pioneering nutrient research leading to the development of agricultural  
management practices and strategies that are used nationally and  
internationally to protect water quality.*

**2009**

**Max J. Paape**

*In recognition of exceptional research and leadership that enhanced animal  
and human health through advances in the identification, control,  
and prevention of bovine mastitis.*

**J. Neil Rutger**

*For demonstrating the usefulness of induction, evaluation,  
and integration of mutants in rice genetics and breeding.*

**B.A. Stewart**

*For exceptional research on soil and crop management practices and  
outstanding leadership of local, national, and international research programs  
to sustain our natural resources.*

**2010**

**Jitender P. Dubey**

*For pioneering research in identifying and aiding in the control  
of protozoan diseases in livestock and humans.*

**Ronald L. Horst**

*For research on calcium and vitamin D metabolism  
resulting in strategies to prevent milk fever in dairy cows  
and for insight into bone disease.*

**L. Dale Van Vleck**

*For extraordinary contributions in expanding quantitative genetic and  
statistical theory and in developing computational procedures that had an  
impact in genetic improvement programs for livestock worldwide.*



**2011**

**Allen R. Dedrick**

*For national and international impact and leadership in the development and application of technology for efficient use of scarce water resources worldwide.*

**Ronald Fayer**

*For scientific leadership of research on parasites of veterinary and medical importance especially protist pathogens affecting food animals and food safety and for leadership of laboratory and agency programs that promoted the objectives of the Agricultural Research Service.*

**Ronald F. Follett**

*For outstanding research contributions in the enhancement of soil, water, and air quality.*

**2012**

**Larry V. Cundiff**

*For extraordinary research and outreach contributions having worldwide impact on genetic improvement programs, choice of breeds, and use of crossbreeding systems for beef production.*

**Donald P. Knowles**

*For innovative scientific leadership and research to solve serious problems in infectious animal diseases, creation of sustained partnerships, and training of future agricultural scientists.*

**Kenneth P. Vogel**

*For contributions to science, perennial grass breeding and genetics, and grassland and bioenergy production systems.*

**2013**

**Rufus L. Chaney**

*For internationally recognized research and applications of science leading to concepts, management, and regulatory actions reducing risks to human health and environmental quality.*

**Sarah Hake**

*For pioneering research and leadership in developmental biology leading to the discovery and elucidation of genes that regulate plant architecture and agricultural productivity.*

**David W. Ramming**

*For pioneering research and leadership in the development of superior table grape, raisin, and stone fruit cultivars responsible for U.S. industry growth and consumer satisfaction.*







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